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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
097331,763	06/25/99	NISHIDA	

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QM32/0214

EXAMINER

MEREK, J

ART UNIT

PAPER NUMBER

3727

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02/14/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/331,763

Applicant(s)

Nishida

Examiner

Joe Merek

Group Art Unit

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☒ Responsive to communication(s) filed on Nov 22, 2000

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 35 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claim

☒ Claim(s) 39-74 is/are pending in the applicat

Of the above, claim(s) _____ is/are withdrawn from consideration

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 39-74 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☒ The drawing(s) filed on Jun 25, 1999 is/are objected to by the Examiner.

☒ The proposed drawing correction, filed on Nov 22, 2000 is ☒ approved ☐ disapproved.

☒ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☒ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) _____

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☒ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s) _____

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

— SEE OFFICE ACTION ON THE FOLLOWING PAGES —

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DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the “bump electrodes and the larger particles” must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Specification

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The following is a quotation of 37 CFR 1.71(a)-(c):

- (a) The specification must include a written description of the invention or discovery and of the manner and process of making and using the same, and is required to be in such full, clear, concise, and exact terms as to enable any person skilled in the art or science to which the invention or discovery appertains, or with which it is most nearly connected, to make and use the same.
- (b) The specification must set forth the precise invention for which a patent is solicited, in such manner as to distinguish it from other inventions and from what is old. It must describe completely a specific embodiment of the process, machine, manufacture, composition of matter or improvement invented, and must explain the mode of operation or principle whenever applicable. The best mode contemplated by the inventor of carrying out his invention must be set forth.
- (c) In the case of an improvement, the specification must particularly point out the part or parts of the process, machine, manufacture, or composition of matter to which the improvement relates, and the description should be confined to the specific improvement and to such parts as necessarily cooperate with it or as may be necessary to a complete understanding or description of it.

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The specification is objected to under 37 CFR 1.71 because it has not been adequately disclosed how the bump electrodes cooperate with the larger particles.

Claim Rejections - 35 USC § 101

3. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

4. Claims 58-76 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The claims specify an apparatus to mount an electronic component to a circuit board but adds limitations to both the method of making the circuit board and the circuit board itself. The claims overlap the statutory classes of invention. See MPEP 2173.05(p) II and Ex parte Lyell.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claim 52 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had

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possession of the claimed invention. It has not been adequately disclosed how the bump electrodes cooperate with the larger particles. It appears that a new hybrid invention is being claimed.

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 52, and 58-76 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Regarding claim 52, a passivation layer is specified. It is unclear how the bump electrodes will cooperate with the large particles or what is required by the passivation layer. It is unclear what is being claimed. Regarding claims 58-76, the claims specify an apparatus to mount an electronic component to a circuit board but adds limitations to both the method of making the circuit board and the circuit board itself. The claims overlap the statutory classes of invention. It is not clear what is being claimed.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

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(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

10. Claims 39-42, 45, 48, 54, and 58-76 are rejected under 35 U.S.C. 102(e) as being anticipated by Murakami. Regarding claims 39 and 41, Murakami teaches at least 20gf per bump force. Col. 5, line 47, where it is stated that the semi-conductor is pressed under heating therefore the leveling, correcting, and the hardening are achieved at the same time or simultaneously. As the bumps are deformed, the leveling occurs. The corrections that applicant is trying to claim are inherent to the process of Murakami. Regarding claim 40, the pressing is toward the circuit board. Regarding claim 42, when the resin is on the board it is considered a sheet. Regarding claim 45, the resin is an adhesive. Regarding claim 48, see Fig. 2A, where the thickness of the resin sheet prior to aligning, is smaller than the width of the connection between the electrode and the electronic component. Regarding claim 54, the resin sheet is on a side of the circuit board. Regarding claims 58-76, as they are best understood specify an apparatus and not the circuit board and are therefore met by Murakami.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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12. Claim 43 is rejected under 35 U.S.C. 103(a) as being unpatentable over Murakami in view of Tsukagoshi et al. Murakami does not teach the sheet being thicker than the gap.

Tsukagoshi et al, as seen in Figs. 8 and 9, teaches the sheet being thicker than the gap. It would have been obvious to employ the thicker sheet of Tsukagoshi et al in the method of Murakami to provide a stronger bond or more bonding material. See Fig. 8, of Tsukagoshi et al where the bonding material 16 is up the sides of the component.

13. Claim 44, 46, and 47, 56, 57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Murakami in view of Tang et al. Regarding claim 44, Murakami does not teach the use of a sheet of anisotropic thermosetting resin. Tang et al teaches bonding a component to a circuit board using a sheet of anisotropic thermosetting resin. It would have been obvious to employ the anisotropic thermosetting resin of Tang et al in the process of Murakami for compensating in deviations in the planarity of the board as taught by Tang et al. Regarding claim 46, the particles of Tang et al are conductive. Regarding claim 47, Tang et al teaches a conductive coating of nickel and gold but does not teach it as the conductive coating for the particles. It would have been obvious to employ it for the particles to eliminate the need for another or different coating for the particles.

14. Claims 49 and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Murakami in view of Tang et al as applied to claim 48 above, and further in view of Matsumoto et al '069 (US 5,040, 069). Regarding claim 48, The modified method of Murakami does not teach the conductive adhesive applied to the bumps. Matsumoto et al '069, teaches the use of

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conductive adhesive on the bumps. It would have been obvious to employ the conductive adhesive of Matsumoto et al '069 in the modified method of Murakami to provide a better or stronger bond. Regarding claim 53, the bumps are forced through the resin and the paste as part of the bumps are hardened prior to adhesion to the board.

15. Claim 50 is rejected under 35 U.S.C. 103(a) as being unpatentable over Murakami. Murakami does not teach the use of flux. Official notice is taken that it is well known to apply flux to metal joints. It would have been obvious to apply a layer of flux to the electrodes of Murakami to provide a better bond.

16. Claim 51 is rejected under 35 U.S.C. 103(a) as being unpatentable over Murakami in view of Viza et al. Murakami does not teach the holes filled with the particles. Viza et al teaches holes filled with particles. It would have been obvious to employ the holes filled with the particles of Viza et al to improve the electrical connection. The modified method of Murakami does not teach the silver particles. Viza et al teaches the use of solder particles but not specifically silver. It is well known to use silver solder. It would have been obvious to employ silver solder since it is an effective product.

17. Claim 52 is rejected under 35 U.S.C. 103(a) as being unpatentable over Murakami in view of Viza et al as applied to claim 51 above, and further in view of Tsukagoshi et al '542 and Matsubara et al. Regarding claim 52, as it is best understood, Murakami does not teach the large particles or the ultrasonic vibrations. Tsukagoshi et al '542, teaches the use of large particles. It would have been obvious to employ the particles of Tsukagoshi et al '542 in the method of

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Murakami to provide required spacing as taught by Tsukagoshi et al '542. Matsubara et al teaches the use of ultrasonic vibrations in the bonding step. It would have been obvious to employ the vibrations of Matsubara et al in the method of Murakami to provide a better bond.

Response to Arguments

18. Applicant's arguments filed 11/22/00 have been fully considered but they are not persuasive. The reference to Murakami teaches applicants invention. The claim specifies that the pressure is what provides the leveling and correcting.

Conclusion

19. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Tagusa et al is cited for Fig. 9. Matsuhira is cited for teaching nickel and gold plating. Larnerd et al is cited for teaching aligning and attaching of devices on a substrate. Tsukagoshi et al '282 and '657 are both cited for teaching anisotropic adhesive compositions.


20. In order to reduce pendency and avoid potential delays, Group 3720 is encouraging FAXing of responses in Office Actions directly into the Group at (703) 305-3579. This practice may be used for filing papers not requiring a fee. It may also be used for filing papers which require a fee by Applicants who authorize charges to a PTO deposit account. Please identify the examiner and art unit at the top of your cover sheet. Papers submitted via FAX into Group 3720 will be promptly forwarded to the examiner.

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21. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joe Merek whose telephone number is (703) 305-0644.

Joe Merek/jm

February 12, 2001


Allan N. Shoap
Supervisory Patent Examiner
Group 3700